THE EFFECT OF AIR POLLUTION ON MORTALITY: META-ANALYSIS RESULTS FROM THE ESCALA PROJECT

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Background and Aims: The ESCALA project investigated the association between PM10 and Ozone and premature mortality in nine Latinamerican cities: São Paulo, Porto Alegre and Rio de Janeiro in Brazil; Concepción, Temuco and Santiago, in Chile; and Mexico City, Monterrey and Toluca in Mexico, from 1997 to 2005. The project used a common methodological framework to estimate city specific effects, providing a comparable set of results. So, the aim of this work is estimating the overall effect of air pollution on mortality in nine Latinamerican cities.
Methods: Unipollutant distributed lag models were fitted in each city using the same controls for temporal and meteorological effects. Fixed and random effects were estimated for six causes of death for all ages and for older than 65 years. Heterogeneity was assessed using Cochran Q test and the I2 percentage.
Results: Most of the results showed heterogeneity among cities, so we report the random effects estimates, as the percentage change in risk for 10 ug/m3 increment of 24hr PM10 or 8hr Ozone levels. For PM10, all causes, all ages estimate the RR is 0.77% (95%CI:0.60-1.00). For RSP a 1.39% (95%CI:1.0-1.8) for all ages and 1.64% (95%CI:1.0,-2.3). For CPM, 0.94% (95%CI:0.84-1.05) for all ages, and 1.15% (95%CI:0.93-1.37) for elder. The highest risk was for COPD, all ages: 2.44% (95%CI:1.36-3.59). Results for O3 showed more variability, with most of the random effects estimates non-significant. The excess risk of death for all causes in all ages was 0.05% (95%CI:-0.24;-0.33). The higher risk was for CPM, 65+ years: 0.28% (95%CI:0.09-0.46).
Conclusions: PM10 was associated with increased mortality in most cities for all and specific causes of death. Higher effects were observed in the elderly (65+ years old) and for respiratory causes. The effects were somewhat higher than those reported in other multi-city studies. Ozone effects were less consistent.